2153

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	David W. Brown	)	Attorney's Ref.: P214021
Serial No.:	10/039,147	)	Art Unit: 2153
Filed:	01/04/2002	)	
Title:	SYSTEMS AND METHODS FOR TRANSMITTING MOTION CONTROL DATA	)	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

Sir:

In accordance with 37 CFR §1.56, the Applicant respectfully submits this Supplemental Information Disclosure Statement to call to the attention of the Examiner the references listed on the attached Forms PTO/SB/08A and PTO/SB/08B for consideration in the prosecution of the above-referenced application for U.S. patent.

Copies of the non-patent literature documents cited in this Information Disclosure Statement are enclosed. Citation of a reference in this Information Disclosure Statement is not an admission that the reference is prior art to the present invention.

It is believed that no fee is due at this time to maintain the application in full force and effect, however if any such fee is due please charge this to Deposit Account No. 502099.

REMARKS

I. U.S. PATENTS

U.S. Patent No. 6,292,174 to Mallet et al. discloses an interface device that provides cursor control with force feedback. A display screen is divided into border interior regions with different cursor movement characteristics in different regions.

U.S. Patent No. 6,028,593 to Rosenberg et al. discloses a system for simulated physical interaction by a user with simulated objects displayed on a computer. Force

feedback is provided based on a mapping position on the simulated object and the physical position of the user object.

U.S. Patent No. 5,821,920 to Rosenberg et al. discloses an apparatus for interfacing a flexible object with an electrical system.

U.S. Patent No. 6,147,647 to Tassoudji et al. discloses a resonator antenna comprising a resonator formed from a dielectric material.

U.S. Patent Nos. 5,956,484 and 6,101,530 to Rosenberg et al., and U.S. Patent Nos. 6,161,126 and 6,125,385 to Wies et al. disclose systems and methods that allow force feedback commands to be transmitted over a network using TCP/IP protocols.

U.S. Patent No. 6,061,004 to Rosenberg discloses a force feedback system in which the position of a user controlled object is detected and a graphical object is displayed on a display screen at a position corresponding to the position of the physical object.

U.S. Patent No. 6,046,727 to Rosenberg et al. discloses a position sensing interface in which a manipulateable object is coupled to a mechanical linkage. Sensors detect movement of the mechanical linkage, and a dedicated microprocessor provides a host computer with information from the sensors.

U.S. Patent No. 6,219,032 to Rosenberg et al. discloses a force feedback interface device in which the desired force sensation is generated based on graphical objects, inner operating system functions, and a location of the cursor.

U.S. Patent No. 6,078,308 to Rosenberg et al. discloses a force feedback system in which, when a mouse encounters a click surface defined by a graphical user interface, a force is output opposing movement of a user object in the direction of the click surface.

U.S. Patent No. 6,317,116 to Rosenberg et al. discloses a system for providing a click surface in a graphical environment that, when in contact with the cursor, causes a force to be generated opposing movement of the user object.

U.S. Patent No. 6,246,390 to Rosenberg discloses an input device for computers.

U.S. Patent No. 6,100,874 to Schena et al. discloses a mouse having force feedback capabilities.

U.S. Patent No. 6,166,723 to Schena et al. discloses a mouse having force feedback capabilities.

U.S. Patent No. 6,128,006 to Rosenberg et al. discloses a mouse having a cursor control wheel that is provided with force feedback capabilities.

U.S. Patent No. 6,243,078 to Rosenberg discloses a system for generating force feedback using conventional mouse buttons and wheels coupled to an actuator.

U.S. Patent No. 6,191,774 to Schena et al. discloses an interface for applying force feedback to a computer mouse.

U.S. Patent No. 6,131,097 to Peurach et al. discloses a system for authoring a geometrical database incorporating touch or haptic feedback.

U.S. Patent No. 6,285,351 to Chang et al. discloses an interface tool for allowing a user to design force sensations for use with a force feedback interface device.

U.S. Patent No. 6,300,936 to Braun et al. discloses an architecture for allowing a plurality of application programs to interface with a force feedback interface device without conflicts.

U.S. Patent No. 6,304,091 to Shahoian et al. discloses a capacitive position sensor that generates a signal having a phase shift relative to an input driver signal based on relative positions of a vane and a stator.

U.S. Patent No. 6,288,705 to Rosenberg et al. discloses a force feedback interface system for computers in which indexing features allow control of the cursor when an offset between local and display frames exists.

U.S. Patent No. 5,438,529 to Rosenberg et al. discloses a percussion system that functions both as a percussion signal input device and a mouse for a personal computer.

U.S. Patent No. 5,623,582 to Rosenberg discloses a system for converting movement of an object into electrical signals that may be processed by a computer.

U.S. Patent No. 5,576,727 to Rosenberg et al. discloses a linkage system the movement of which is transduced into electrical signals that are processed by an application on a computer. Force feedback commands are transmitted back to the linkage apparatus. The linkage apparatus converts the force feedback commands into movement that is felt by the user.

U.S. Patent No. 5,691,898 to Rosenberg et al. discloses a computer input device that generates force feedback movement based on operation of a switch at the device and on force feedback commands generated by the host computer system.

U.S. Patent No. 6,057,828 to Rosenberg et al. discloses a force feedback mechanism for a host computer. A local microprocessor on the force feedback mechanism receives command from the host, decodes the commands, and outputs

actuator signals to a mechanical system. The commands simulate touch sensations such as moving through fluids or impacting a surface or obstruction.

U.S. Patent No. 6,271,833 to Rosenberg et al. discloses a force feedback device in which the device is enabled only when an amount of weight over a predetermined amount is placed on the joystick of the device.

U.S. Patent No. 5,889,672 to Schuler et al. discloses an interface device for computers having programmable force position characteristics. The force position characteristics relay the tactile responsiveness of the device to the position of a cursor on a display screen.

U.S. Patent No. 6,195,592 to Schuler et al. discloses a force feedback interface system having tactile responsiveness that is flexibly programmable.

U.S. Patent No. 6,169,540 to Rosenberg et al. discloses a software interface for allowing a user to design force sensations for use by a force feedback interface device connected to a host computer.

U.S. Patent No. 5,701,140 to Rosenberg et al. discloses a linkage system the movement of which is transduced into electrical signals that are processed by an application on a computer. Force feedback commands are transmitted back to the linkage apparatus. The linkage apparatus converts the force feedback commands into movement that is felt by the user.

U.S. Patent No. 5,739,811 to Rosenberg et al. discloses a system that send sensor data from a user interface device to a host computer. The system can operate on a host controlled environment in which force values are generated by the host computer or in a reflex environment in which force values are generated by a processor at the interface device given high levels of advisory commands generated by the host computer.

U.S. Patent No. 5,734,373 to Rosenberg et al. discloses a force feedback system for use by a host computer and a force feedback device. A local microprocessor at the force feedback device implements a local reflex process based on high level commands to generate force values for actuators at the force feedback device. The programmer of the host computer deals only with a relatively few high level host commands, with the bulk of the force feedback computation being handled at the local processor.

U.S. Patent No. 6,104,158 to Jacobus et al. discloses a force feedback system that simulates the presence of a force field around the user. This system includes a six-

axis manipulator having two constant force springs that provide gravity compensation so that the manipulator floats.

U.S. Patent No. 6,219,033 to Rosenberg et al. discloses an input device for a computer having a local microprocessor that controls an actuator within the input device and provides sensor data to a host computer.

U.S. Patent No. 6,300,937 to Rosenberg discloses a force feedback interface device that operates in a host controlled embodiment or in a reflex embodiment.

U.S. Patent No. 6,232,891 to Rosenberg discloses a force feedback interface device that operates in isotonic and isometric control modes.

U.S. Patent No. 6,252,853 to Ohno discloses a label switching router employing a fault circumventing route table that allows continued communication between adjacent nodes on opposite sides of an ATM switch if a fault occurs on the data relay controller.

U.S. Patent No. 6,278,439 to Rosenberg et al. discloses a system for shaping force signals for a force feedback device.

U.S. Patent No. 6,259,382 to Rosenberg discloses a force feedback system that operates in isotonic and isometric control modes.

U.S. Patent No. 6,020,876 to Rosenberg et al. discloses a force feedback system having a disturbance filter for reducing or eliminating disturbances associated with the output force sensations. The filter removes the effect of feedback forces that would otherwise cause a controlled graphical object to be displayed in an undesired location.

U.S. Patent No. 6,310,605 to Rosenberg discloses a force feedback device that employs a selective disturbance filter to reduce or eliminate displayed disturbances associated with output force sensations.

U.S. Patent No. 5,959,613 to Rosenberg et al. discloses a force feedback system in which force signals sent to a force feedback device are shaped by a set of control parameters and modified by a set of impulse parameters.

U.S. Patent No. 6,292,170 to Chang et al. discloses a software tool for assisting a user in developing applications for controlling force feedback interface devices. This tool allows the user to integrate sounds with force feedback features.

U.S Patent No. 5,889,670 to Schuler et al. discloses a force feedback system for computer input in which the force position characteristics of the system are programmable and responsive to a position of the cursor on a display screen.

U.S. Patent No. 5,825,308 to Rosenberg discloses an interface for a feedback system. The interface system displays a physical object moveable in a physical space.

In an isotonic mode, force sensations are applied to the physical object based on movement of the cursor and position of the physical object. In an isometric mode, input force applied by the user to the physical object results in input to the host computer.

U.S. Patent No. 6,252,579 to Rosenberg et al. discloses a force feedback interface device that employs a scaled cursor position in a display frame derived from a reference position of the mouse.

U.S. Patent No. 6,292,712 to Bullen discloses a multimedia interface system that incorporates text, audio, and video graphics with an outside environment such as a robotic device, machining device, or other tool.

U.S. Patent No. 6,292,714 to Okabayashi discloses a system for integrating robot motion with content software running on a computer.

U.S. Patent No. 5,848,415 to Guck discloses a content server that uses an object database to support a network of clients. Virtual objects in the database enable the format of any source document to be converted to another compatible format to transport the appropriate protocol.

U.S. Patent No. 6,173,316 to De Boor et al. discloses an extended form of HTML adapted for use by wireless telephones.

U.S. Patent No. 6,038,603 to Joseph discloses a system in which a URL contains first and second values corresponding to presence of an encapsulating protocol and an operation protocol. A second computer provides a resource store that is accessed in accordance with the operation protocol.

U.S. Publication 2001/0020944 to Brown et al. discloses control software for generating and distributing motion media for operating a target motion device.

U.S. Publication 2001/0032268 to Brown et al. discloses a system for allowing an application program to communicate with any one of the group supported hardware devices.

II. NON-PATENT LITERATURE REFERENCES

"Inside Direct X – In Depth Techniques for Developing High-Performance Multimedia Applications" by Bradley Bargen and Peter Donnely, dated 1988, and "Inside Direct3D – The Definitive Guide for Real-Time 3D Power and Performance for Microsoft Windows" by Peter Kovach, dated 2000. These books describe Microsoft's Direct X system for allowing more computer software developers to access low level hardware functionality.

"CANopen Implementation – Applications to Industrial Networks" by M. Farsi and M. Barbosa, dated 2000. This book describes the network protocol called Controller Area Network (CAN) which is a message based, packetized, network protocol used for talking to industrial motion controllers.

"CAN System Engineering – From Theory to Practical Applications" by W. Lawrenz, dated 1997. This book also describes the network protocol called Controller Area Network (CAN) which is a message based, packetized, network protocol used for talking to industrial motion controllers.

"CNCnet Software Library" by Allen-Bradley, dated October, 1992. This product specification user manual describes a library of software functions that may be called by an application program. The CNC net functions hide the details of the network protocol and the need for the application programmer to develop custom communication drivers.

"CAN Specification" Version 2.0, by Robert Bosch, dated September, 1991. This document describes a system for implementing a serial communication. The system described in this reference comprises an object layer and transfer layer arranged between an application layer and a physical layer.

"Overview and Introduction to the Manufacturing Message Specification (MMS)" published by Sisco, Inc., dated 1995. The MMS system is a standardized messaging system that allows real time data and supervisory control information to be exchanged between network devices and computer applications.

ISO 9506-1 entitled "Industrial Automation Systems-Manufacturing Message Specification-Part 1: Service Definition" and ISO 9506-2 entitled "Industrial Automation Systems-Manufacturing Message Specification-Part 2: Protocol Specification". These documents disclose an application layer standard that allows message communications to and from programmable devices in a computer integrated manufacturing environment.

"MMS-Ease" published by Systems Integration Specialists Company, Inc., dated January, 1996. This document discloses a C-language application programming interface for the Manufacturing Message Specification (MMS). This interface consists of a library of C-language function calls and data structures in a manner that is independent of the MMS application, device, or operating system.

"Electrical and Mechanical Interface Characteristics and Line Control Protocol Using Communication Control Characters for Serial Data Link Between a Direct Numerical Control System and Numerical Control Equipment Employing Asynchronous Full Duplex Transmission" published by the Electronics Industries Association, dated

June, 1995. This document discloses a communication standard for use in digital data communication links between numerical control systems in numerical control units. These standards are further intended to allow direct numerical control systems and numerical control units of the same or different vendor sources to communicate using a common messaging syntax and protocol.

ISO/IEC 7498-1 "Information Technology—Open Systems Interconnection-Basic Reference Model: The Basic Model", dated November, 1994 describes the open systems interconnection (OSI) system for allowing open systems to communicate with each other.

ISO/IEC 7498-3 "Information Technology—Open Systems Interconnection-Basic Reference Model: Naming and Addressing", dated April, 1997 discloses the naming and addressing conventions of the open OSI model.

"The Benefits and Data Bottlenecks of High Speed Milling" by Todd J. Schuett, dated 1996-1997, and presented August, 1995. This document describes the effects of data bottlenecks on deviation of actual milling paths from designed milling paths.

"The Ultimate DNC; Direct CNC Networking (DCN)" by Todd J. Schuett, dated January, 1996. This article discloses the concept of direct CNC network, in which the CNC control is connected right onto the same network as the CAD/CAN computer systems.

"Advanced Controls for High Speed Milling" by Creative Technology Corporation, dated May, 1996. This paper discloses a networking scheme for improving dataflow between a CAD/CAN work station and a CNC machine.

"A Manufacturing Cell Integration Solution" by Leitao and Lopes, dated October 1995. This paper discusses the manufacturing message specification (MMS) standard protocol for communication in the manufacturing process environment.

"Mitsubishi Electric Advance: Programmable Logic Controllers Edition", dated September, 1996. This journal contains a number of articles describing the process of operating programmable logic controllers using computer rated software design systems.

"Flexible and Reliable Robotics Cells in Factory Automation" by M. Farsi, dated 1993. This document discusses using a network (CAN) to link various hardware components together to produce an overall system. Each module abides by ASPIC protocol to communicate with one another in a consistent manner.

"Development of a Practical SFC System for CNC Machine Shop" by Louis Kam-Piu Chu and Shang-Hua Wang, dated 1994. This document discusses communication with CNC's using DNC to transfer part programs to each machine using ISO codes and proprietary control codes, where all CNC machines have been altered to use the same proprietary control codes.

"Device Communication for Flexible Manufacturing: A New Concept" by M. Farsi, dated 1994. This document is a description of a network (CAN) based messaging protocol (ASPIC) used to communicate with various industrial automation devices in a consistent manner.

"A Production Cell Communication Model in Factory Automation Using Controller Area Network" by M. Farsi, dated 1995. This document discusses using a network (CAN) to link various hardware components together to produce an overall system. Each module abides by ASPIC protocol and hardware CAN enabled conversion module to communicate with one another in a consistent manner using ASPIC Messages.

"CANopen: The Open Communications Solution" by M. Farsi, dated 1996. This document describes a network (CAN) based messaging protocol used to communicate with various industrial automation devices.

"A Motion Control System with Event-driven Motion-module Switching Mechanism for Robotic Manipulators" by Katayama et al., dated July, 1993. This reference disclosed a motion control system that employs an event-driven motion module switching mechanism.

"An Event-Driven Architecture for Controlling Behaviors of the Office Conversant Mobile Robot, Jijo-2" by Matsui et al., dated April 1997. This document discloses a layered process network architecture based on an event-driven control model.

"How to Write and Use ActiveX Controls for Microsoft Windows CE 3.0" by Microsoft Corporation, dated June, 2000. This document discloses how to build and distribute ActiveX controls for Windows CE.

"Notes on Implementing an OLE Control Container" by K. Brockschmidt of Microsoft Corporation, dated September 21, 1994. This document discloses the programming of container applications that can interact and exploit OLE controls.

"What OLE Is Really About" by K. Brockschmidt of Microsoft Corporation, dated July, 1996. This document discusses how OLE addresses practical problems encountered in operating systems and applications.

"Categorizing by Component Capabilities" by Microsoft Corporation, dated November, 2001. This document discusses the use of category IDs to identify component categories.

CONCLUSION

The Applicant respectfully submits that the cited references in this case, taken alone or in combination, neither anticipate nor render obvious the present invention. Consideration of the foregoing in relation to the pending application is respectfully requested. If there is any matter which needs attention, and if the Examiner feels that consultation with the applicant's attorney, the undersigned herein, would be of value, then such consultation would be welcome. The applicant's attorney can be reached at the phone number noted below.

Signed at Bellingham, County of Whatcom, State of Washington, this 25TH day of March, 2004.

Respectfully submitted,

DAVID W. BROWN

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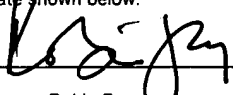
Signature: 

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 3

Complete if Known	
Application Number	10/039,147
Filing Date	01/04/2002
First Named Inventor	David W. Brown
Group Art Unit	2153
Examiner Name	G. Burgess
Attorney Docket Number	P214021

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[2]	U.S. Patent Document Number	Kind Code[2]	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		6,292,174		Mallett et al.	09/18/2001	
		6,028,593		Rosenberg et al.	02/22/2000	
		5,821,920		Rosenberg et al.	10/13/1998	
		6,147,647		Tassoudji et al.	11/14/2000	
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		6,125,385		Wies et al.	09/26/2000	
		6,061,004		Rosenberg	05/09/2000	
		6,046,727		Rosenberg et al.	04/04/2000	
		6,219,032		Rosenberg et al.	04/17/2001	
		6,078,308		Rosenberg et al.	06/20/2000	
		6,317,116		Rosenberg et al.	11/13/2001	
		6,246,390		Rosenberg	06/12/2001	
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		6,191,774		Schena et al.	02/20/2001	
		6,131,097		Peurach et al.	10/10/2000	

FOREIGN PATENT DOCUMENTS

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		5,734,373		Rosenberg et al.	03/31/1998	
		6,104,158		Jacobus et al.	08/15/2000	
		6,219,033		Rosenberg et al.	04/17/2001	
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		6,232,891		Rosenberg	05/15/2001	

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	Cite No.[1]	Foreign Patent Document Office[3]	Number	Kind Code[5] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

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Sheet 1 of 3

Complete if Known	
Application Number	10/039,147
Filing Date	01/04/2002
First Named Inventor	David W. Brown
Group Art Unit	2153
Examiner Name	G. Burgess
Attorney Docket Number	P214021

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
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	1	BRADLEY BARGEN and PETER DONNELY; Inside Direct X – In Depth Techniques for Developing High-Performance Multimedia Applications; 1988; Chps. 1, 18-20, 22-27; Microsoft Press; U.S.	
	2	PETER KOVACH; Inside Direct3D – The Definitive Guide for Real-Time 3D Power and Performance for Microsoft Windows; 2000; Chps. 1, 7, 15; Microsoft Press; U.S.	
	3	M. FARSI and M. BARBOSA; CANopen Implementation - Applications to Industrial Networks; 2000; Research Studies Press Ltd.; England and U.S.	
	4	WOLFHARD LAWRENZ; CAN System Engineering – From Theory to Practical Applications; 1997; Springer-Verlag New York, Inc.; U.S.	
	5	ALLEN-BRADLEY; "CNCnet Software Library"; October, 1992; Publication 8000-6.1.1; U.S.	
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	8	ISO-9506-1 "Industrial Automation Systems—Manufacturing Message Specification—Part 1: Service definition"; August, 2000; pp. i-22; ISO/IEC; Switzerland.	
	9	ISO-9506-2 "Industrial Automation Systems—Manufacturing Message Specification—Part 2: Protocol specification"; August 2000; pp. i.-6; ISO/IEC; Switzerland.	
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Sheet 2 of 3

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	12	ISO/IEC 7498-1 "Information Technology—Open Systems Interconnection-Basic Reference Model: The Basic Model"; November 1994; U.S.	
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	14	TODD J. SCHUETT; "The Benefits and Data Bottlenecks of High Speed Milling"; August, 1995; conference paper presented at Southeastern Michigan Chapter American Mold Builders Association; Creative Technology Corporation; U.S.	
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	23	FARSI, M. "CANopen: The Open Communications Solution"; 1996; pp. 112-116.	
	24	KATAYAMA et al.; "A Motion Control System with Event-driven Motion-module Switching Mechanism for Robotic Manipulators"; IEEE International Workshop on Robot and Human Communication; July, 1993; pp. 320-325; U.S.	
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	26	MICROSOFT CORPORATION; "How to Write and Use ActiveX Controls for Microsoft Windows CE 3.0"; Windows CE 3.0 Technical Articles; June, 2000; pp. 1-5.	
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